

**Abstract**

A system for monitoring and controlling aperture etching in an alternating aperture phase shift mask is provided. The system includes one or more light sources, each light source directing light to one or more apertures etched on a mask. Light  
5 reflected from the apertures is collected by a measuring system, which processes the collected light. The collected light is indicative of properties including the depth, width and/or profile of the openings on the mask. The measuring system provides such depth, width and/or profile related data to a processor that determines the acceptability of the aperture and/or the mask. The system also includes a plurality of  
10 etching devices associated with etching apertures in the mask. The processor may selectively control the etching devices so as to regulate aperture etching.